Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1.   (Cancelled)

2.   (Cancelled)

3.   (Cancelled)

4.   (Cancelled)

5.   (Cancelled)

6.   (Cancelled)

7.   (Cancelled)

8.   (Cancelled)

9.   (Cancelled)

10.   (Cancelled)

11.   (Cancelled)

12.   (Cancelled)

13.   (Cancelled)

14.   (Cancelled)

15.   (Cancelled)

16.   (Cancelled)

17.   (Cancelled)

18.   (Currently Amended) A method of journaling or logging a file system, The method of Claim 17, comprising:

resetting or deleting a snapshot after all application-level file system activity completes; and

initiating a transaction in which a snapshot of the current state is created of a file system volume in which the snapshot is made through hardware and in which, during the transaction, the file system operates normally,

wherein the method is implemented by a computer system in which a computer communicates to a storage controller during the transaction,

the method is further implemented by a file system volume and a snapshot volume both of which are coupled to the storage controller,

the transaction further comprises a series of read and/ or write operations on file system blocks containing either data or file system metadata,

any read or write operation is directed to the storage controller for processing, any write operation directed to the storage controller causes a copy-on-write action within the storage controller,

a copy-on-write operation is processed within the storage controller by first reading the original data from the file system volume, then writing said original data to the snapshot volume, and then overlaying said original data on the file system with new data,

the method involves no more than one data transfer on the system bus per write operation,

the snapshot mechanism is wholly contained within the storage controller and comprises a microprocessor, a memory, and either software or firmware,

and the file system did not originally have a journaling or logging capability and is being retrofitted to have this capability.

19.   (Original) The method of Claim 18, wherein software for the file system does not manage any form of sequential journal or log.

20.   (Cancelled)

21.   (Cancelled)

20.   (Cancelled)

21.   (Cancelled)

22.   (Cancelled)

23.   (Cancelled)

24.   (Cancelled)

25.   (Cancelled)

26.   (Cancelled)

27.   (Cancelled)

28.   (Cancelled)